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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/733,516

12/12/2003

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34090-06297

9084

25243 7590 12/19/2008
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EXAMINER

ESHETE, ZELALEM

ART UNIT

PAPER NUMBER

3748

MAIL DATE

DELIVERY MODE

12/19/2008

PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRIAN RUGGIERO

Appeal 2008-1417
Application 10/733,516
Technology Center 3700

Decided: December 18, 2008

Before WILLIAM F. PATE, III, LINDA E. HORNER, and
KEN B. BARRETT, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Brian Ruggiero (Appellant) seeks our review under 35 U.S.C. § 134 from a final rejection of claims 1, 3-7, 20-23, and 28-30. (*See* Amended App. Br. 2.) Appellant, after the final rejection, canceled claim 31. (Amend. After Final dated May 10, 2006; *see also* Advisory Action dated

Nov. 14, 2006 (Examiner acknowledging the same).) We have jurisdiction under 35 U.S.C. § 6(b).

SUMMARY OF THE DECISION

We AFFIRM.

THE INVENTION

Appellant's claimed invention pertains to a system for actuating engine valves utilizing a master piston, two slave pistons and a hydraulic control valve. (Spec. ¶ 0011.) The system may be used in conjunction with a fixed profile cam to provide variable valve actuation. (Spec. ¶¶ 0004, 0025-0027.) Claim 1, reproduced below, is representative of the subject matter on appeal.

1. A system for actuating two engine valves each having an axial center spaced a first distance from each other, said system comprising:
 - a housing having a first slave piston bore, a second slave piston bore, and a passage adapted to provide hydraulic fluid to the first and second slave piston bores;
 - a first slave piston slidably disposed in the first slave piston bore and a second slave piston slidably disposed in the second slave piston bore, said first and second slave pistons each having an axial center spaced a second distance from each other;
 - a master piston operatively connected to the housing passage;
 - a hydraulic fluid control valve operatively connected to the housing passage; and
 - a valve bridge disposed between (i) the first and second slave pistons and (ii) the two engine valves,wherein the first distance is different than the second distance.

THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Hausknecht	US 4,153,016	May 8, 1979
Cosma	US 5,619,965	Apr. 15, 1997
Egan, III	US 6,112,710	Sep. 5, 2000
Meneely	US 6,386,160 B1	May 14, 2002
Vorih	US 6,412,457 B1	July 2, 2002
Vanderpoel	US 6,474,277 B1	Nov. 5, 2002

The following rejections are before us for review:

1. The Examiner rejected claims 1, 3, 5-7, 20-22 and 29 under 35 U.S.C. § 103 as obvious over Egan and Meneely;
2. The Examiner rejected claims 7 and 28 under 35 U.S.C. § 103 as obvious over Egan, Meneely, and Vorih;
3. The Examiner rejected claim 30 under 35 U.S.C. § 103 as obvious over Egan, Meneely, and Hausknecht.

The Examiner has withdrawn the rejection of claim 4 under 35 U.S.C. § 103 as obvious over Egan and Meneely (*see* Ans. 3), and states that that claim would be allowable if rewritten in independent form (Ans. 7). The Examiner has also withdrawn the rejection of claim 23 under 35 U.S.C. § 103 as obvious over Egan, Cosma, and Vanderpoel. (*See* Ans. 7 (stating that claim 23 is allowed).) Accordingly, those rejections are not before us for review.

ISSUES

The issues before us are whether the Appellant has shown that the Examiner erred in rejecting claims 1, 3, 5-7, 20-22 and 29 as unpatentable over Egan and Meneely; in rejecting claims 7 and 28 as unpatentable over

Egan, Meneely, and Vorih; and in rejecting claim 30 as unpatentable over Egan, Meneely, and Hausknecht. These issues all turn on whether one of ordinary skill in the art would have found it obvious to combine the teachings of Egan and Meneely to arrive at the claimed system.

FINDINGS OF FACT

We find that the following enumerated findings are supported by at least a preponderance of the evidence.

1. The customary meaning of “piston” in the mechanical arts is a sliding piece moved by or moving against fluid pressure which usually consists of a short cylinder fitting within a cylindrical vessel along which it moves back and forth. MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY 886 (10th ed. 1996).

2. Egan discloses a system for actuating two engine valves. (*See* Egan, col. 2, ll. 41-43; Fig. 3.) Egan teaches a housing 31 having a first slave piston bore (in the first slave piston assembly 34 depicted in Figure 3), a second slave piston bore (in the second slave piston assembly 34 depicted in Figure 3), and a passage 33 adapted to provide hydraulic fluid to the first and second slave piston bores. (Egan, col. 6, ll. 47-52; Fig. 3.)

3. Egan also discloses a first slave piston slidably disposed in the first slave piston bore and a second slave piston slidably disposed in the second slave piston bore. (Egan, Fig. 3 (the two items 34).) Egan discloses a master piston 32 operatively connected to the housing passage and a hydraulic fluid control valve 35 operatively connected to the housing passage. (Egan, col. 6, ll. 45-46, 52-56.)

4. Meneely teaches a device for actuating two engine valves. (Meneely, col. 4, ll. 20-27.) Meneely discloses an example of the device in which a valve bridge 20 is disposed between two pistons, 96 and 98, and two engine valves, 16 and 18. (Meneely, col. 4, ll. 30-31; col. 5, ll. 43-46; Fig. 1.) In this example, the pistons are mounted above the valves such that the distance between the axial centers of the valves appears to be the same as the distance between the axial centers of the pistons. (See Meneely, Fig. 1.) Meneely states that “an additional piston [could be] added and the positions of the pistons altered.” (Meneely, col. 5, ll. 48-50.)

5. Meneely discloses a second embodiment of a device for actuating two valves utilizing a valve bridge 220. (Meneely, col. 7, ll. 13, 32-36; Figs. 9-16.) In this second embodiment, the bridge is disposed between the valves on one side and first and second members (222 and 224, respectively) on the other side. (Meneely, col. 7, ll. 36-40, 41-45; Fig. 10.)

6. Meneely’s cylindrical first member 222 (also identified as a “valve spool”) reciprocates in its bore 286 and is moved by pressurized oil. (See Meneely, col. 8, l. 12; col. 9, l. 13-15, 24-27, 38-42; Fig. 9.) Therefore, the first member 222 is a hydraulic piston.

7. Pressurized oil moves Meneely’s piston 226 downwardly. (Meneely, col. 9, ll. 8-11.) This movement of piston 226 extends the second member 224. (*Id.*, col. 9, ll. 11-12.)

8. In Meneely’s second embodiment, the distance between the axial centers of the two valves, 216 and 218, and the distance between the axial centers of the pistons, 222 and 226, are different. (Meneely, Fig. 13.)

9. Therefore, Meneely teaches, via the second embodiment, a valve bridge disposed between (i) two hydraulic pistons and (ii) two engine

valves, where the distance between the valves is different than the distance between the pistons.

10. Meneely shows that the relative location of the pistons on the bridge is variable.

11. The Examiner found that Meneely's two pistons are not identical, and that Meneely thereby discloses a second piston having a greater mass than a first piston. (Ans. 5 (citing Meneely, Fig. 10).) Apparently, the Examiner assumes them to be of the same composition. We agree that the two pistons shown in Meneely's second embodiment do not appear to be identical in size. (*See, e.g.*, Meneely, Fig. 10.) Appellant does not point to any evidence suggesting that Meneely's pistons have the same mass. Therefore, it is reasonable to assume that Meneely discloses a second piston that has a greater mass than the first piston.

12. The prior art references of record indicate that the ordinary artisan in the mechanical arts, including those arts pertaining to engine valve actuation systems, has a relatively high level of skill. For example, Meneely shows that the artisan has an understanding of complex valve actuating systems utilizing a cam, rocker arm and hydraulics. (*See, e.g.*, Meneely, Figs. 1, 9.)

PRINCIPLES OF LAW

During examination of a patent application, pending claims are given their broadest reasonable construction consistent with the Specification. *In re Prater*, 415 F.2d 1393, 1404-05 (CCPA 1969); *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). It is Appellant's burden to precisely define the invention, not the United States Patent and Trademark

Office's. *In re Morris*, 127 F.3d 1048, 1056 (Fed. Cir. 1997) (citing 35 U.S.C. § 112, ¶ 2). Appellants have the opportunity to amend the claims during prosecution, and broad interpretation by the Examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. *Prater*, 415 F.2d at 1404-05.

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007) (quoting 35 U.S.C. § 103). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966); *see also KSR Int’l Co.*, 127 S. Ct. at 1734 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”). The scope and content of the prior art includes the explicit and inherent teachings of the prior art. *In re Zurko*, 258 F.3d 1379, 1383-84 (Fed. Cir. 2001) (citing *In re Napier*, 55 F.3d 610, 613 (Fed. Cir. 1995)).

In *KSR*, the Supreme Court emphasized “the need for caution in granting a patent based on the combination of elements found in the prior art,” *KSR Int’l Co.*, 127 S. Ct. at 1739, and discussed circumstances in which a patent might be determined to be obvious. In particular, the Court pointed out that “the principles laid down in *Graham* reaffirmed the ‘functional

approach’ of *Hotchkiss* [v. *Greenwood*], 11 How. 248 [(1851)].” *KSR Int’l Co.*, 127 S. Ct. at 1739 (citing *Graham*, 383 U.S. at 12). The Court reiterated that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* The Court also noted that “when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result.” *Id.* at 1740 (citing *United States v. Adams*, 383 U.S. 39, 50-51 (1966)). The Court explained:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

Id. at 1740. The operative question in this “functional approach” is thus “whether the improvement is more than the predictable use of prior art elements according to their established functions.” *Id.*

ANALYSIS

The Rejection of Claims 1, 3, 5-7, 20-22 and 29 Under 35 U.S.C. § 103 as Obvious Over Egan and Meneely

Appellant asserts that the Examiner erred in finding that Meneely discloses a valve bridge disposed between engine valves and “slave pistons.” (App. Br. 8 (citing Final Rej. 3); Reply Br. 2.) Appellant argues that Meneely does not disclose a master piston to actuate Meneely’s disclosed pistons, and, therefore, the latter cannot be “slave pistons.” (App. Br. 9-10;

Reply Br. 2.) However, “[n]on-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.” *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (citing *In re Keller*, 642 F.2d 413, 425 (CCPA 1981)). As discussed below, the Egan reference does disclose master and slave pistons, and the combination of references includes those structures. Therefore, the Examiner’s use of the phrase “slave pistons” in the context of Meneely is, at most, harmless error.

We agree with the Examiner that the cited prior art would have rendered the claimed valve actuating system obvious to a person of ordinary skill in the art. Egan teaches a system for actuating two engine valves. (Fact 2.) Egan’s disclosed system has a master piston, two slave pistons, a housing with a hydraulic fluid passage and slave piston bores, and a hydraulic fluid control valve. (Facts 2-3.) Meneely similarly teaches a device for actuating two valves. (Facts 4-5.) Meneely teaches a valve bridge disposed between (i) two hydraulic pistons and (ii) two engine valves, where the distance between the valves is different than the distance between the pistons. (Facts 5-9.) Thus, it would have been obvious to add the valve bridge and the different valve/piston spacing taught by Meneely to Egan’s master/slave piston configuration. Appellant has not shown that the combination of Meneely and Egan produces unpredictable results. Therefore, Appellant’s claimed invention is merely the obvious combination of familiar elements according to known methods. *See KSR Int’l Co.*, 127 S. Ct. at 1739.

Appellant argues that the Examiner failed to identify a suggestion or motivation “to modify the Egan system as needed to meet the claims.”

(App. Br. 8.) This argument is foreclosed by *KSR*, in which the Court rejected the rigid requirement of a teaching, suggestion or motivation to combine known elements in order to show obviousness. *KSR Int'l Co.*, 127 S.Ct. at 1741. The Court noted that an obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.*

Nonetheless, Meneely teaches the use of a valve bridge between engine valves and hydraulic pistons, thus providing a teaching to insert such a bridge between Egan’s valves and slave pistons. Further, Meneely shows that the relative location of the pistons on the bridge (and, therefore, the distances between pistons) is variable. (*See* Fact 10.)

Appellant acknowledges that Meneely discloses that the position of the pistons could be altered. (App. Br. 9.) Appellant contends, however, that Meneely “would not have suggested to one of ordinary skill in the art the advantage realized by modifying the distance between two slave pistons as claimed in the present application.” (*Id.*) This argument is not persuasive as the reason to combine the references is not limited to seeking the purported advantages realized by Appellant. *See KSR Int'l Co.*, 127 S.Ct. at 1741-42.

Appellant contends that one of ordinary skill would not have expected the combination of Egan and Meneely to produce a successful valve actuation system. (App. Br. 11.) Appellant theorizes that the combination would produce a configuration such that “the engine valve stems would be exposed to a side load causing damaged [sic] or failure.” (App. Br. 11.) Appellant’s speculative argument is based on the assumption that a person of

ordinary skill in the art would blindly combine the exact embodiments shown. (See App. Br. 11.) “The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art.” *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (citations omitted). A person of ordinary skill is not an automaton, and is expected to exercise common sense. See *KSR Int’l Co.*, 172 S.Ct. at 1742. The prior art shows that the ordinary artisan has a relatively high level of skill. (Fact 12.) Therefore, the person of ordinary skill in the art would understand that he or she is not constrained to locate the pistons and valves exactly as shown in Meneely’s figures. The teachings of Meneely in combination with the teachings of Egan provide a reasonable expectation of success.

Appellant has not demonstrated that the Examiner erred in rejecting claim 1 as unpatentable over Egan and Meneely. Accordingly, we sustain the rejection of claim 1.

Claim 6, which depends indirectly from claim 1, adds the limitation that reads “the second slave piston has a greater mass than the first slave piston.” In addition to the arguments presented for claim 1, Appellant argues that claim 6 is patentable because “Meneely does not disclose any slave pistons at all, much less two slave pistons with different masses.” (App. Br. 13.) Other than this conclusory assertion, Appellant does not offer any argument or evidence to rebut the Examiner’s finding that Meneely discloses pistons having different masses. Appellant does not contend that the use of pistons of different masses is unknown to persons of ordinary skill in the art or yields anything other than predictable results. (See App. Br.

13.) Thus, Appellant has failed to show that the Examiner erred in rejecting claim 6.

Appellant has provided no separate arguments directed to the merits of claims 3, 5, 7, 20-22 and 29, but rather asserts that those claims are patentable because they depend either directly or indirectly from claim 1. Because we affirm the rejection of claim 1, we also sustain the rejection of 3, 5, 7, 20-22 and 29.

The Rejection of Claims 7 and 28 Under 35 U.S.C. § 103 as Obvious Over Egan, Meneely, and Vorih

Claims 7 and 28 depend from claim 3, which depends from claim 1. Appellant does not offer separate arguments for the patentability of claims 7 and 28. (App. Br. 13.) Rather, Appellant merely asserts that claims 7 and 28 are patentable for the previous reasons given for claims 1 and 3. (*Id.*) As Appellant has failed to show that the Examiner erred in rejecting claims 1 and 3, Appellant has also failed to show error in the rejection of dependent claims 7 and 28. Thus, we sustain the rejection of claims 7 and 28.

The Rejection of Claim 30 Under 35 U.S.C. § 103 as Obvious Over Egan, Meneely, and Hausknecht

As to claim 30, Appellant asserts only that that claim 30 “depends from Claim 1 and is patentable for the reasons that Claim 1 is patentable[.]” (App. Br. 14.) Because we affirm the rejection of claim 1 and Appellant does not offer separate arguments for the patentability of claim 30, we also sustain the rejection of claim 30.

CONCLUSIONS

We conclude that the Appellant has failed to show that the Examiner erred in rejecting claims 1, 3, 5-7, 20-22 and 29 under 35 U.S.C. § 103 as obvious over Egan and Meneely, claims 7 and 28 under 35 U.S.C. § 103 as obvious over Egan, Meneely, and Vorih, and claim 30 under 35 U.S.C. § 103 as obvious over Egan, Meneely, and Hausknecht.

DECISION

The decision of the Examiner to reject claims 1, 3, 5-7, 20-22, and 28-30 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

Appeal 2008-1417
Application 10/733,516

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